

ABSTRACT OF THE DISCLOSURE

An electrosurgical instrument that allows precise modulation of active Rf density in an engaged tissue volume. The working end of the instrument has a tissue-contacting surface of a conductive-resistive matrix that is variably resistive depending on its temperature. The matrix comprises a positive temperature coefficient (PTC) polymeric material that exhibits very large increases in resistivity as any local portion increases beyond a selected temperature. In a method of use, the polymeric PTC material senses the temperature of engaged tissue in a manner akin to pixel-by-pixel sensing and thereby changes its resistance in a corresponding pixel-by-pixel manner. The instrument further carries cooling means to cause accelerated thermal relaxation of the PTC matrix during use to make the engagement surface highly responsive to temperature changes that in turn alter the matrix between being electrically conductive and electrically resistive.